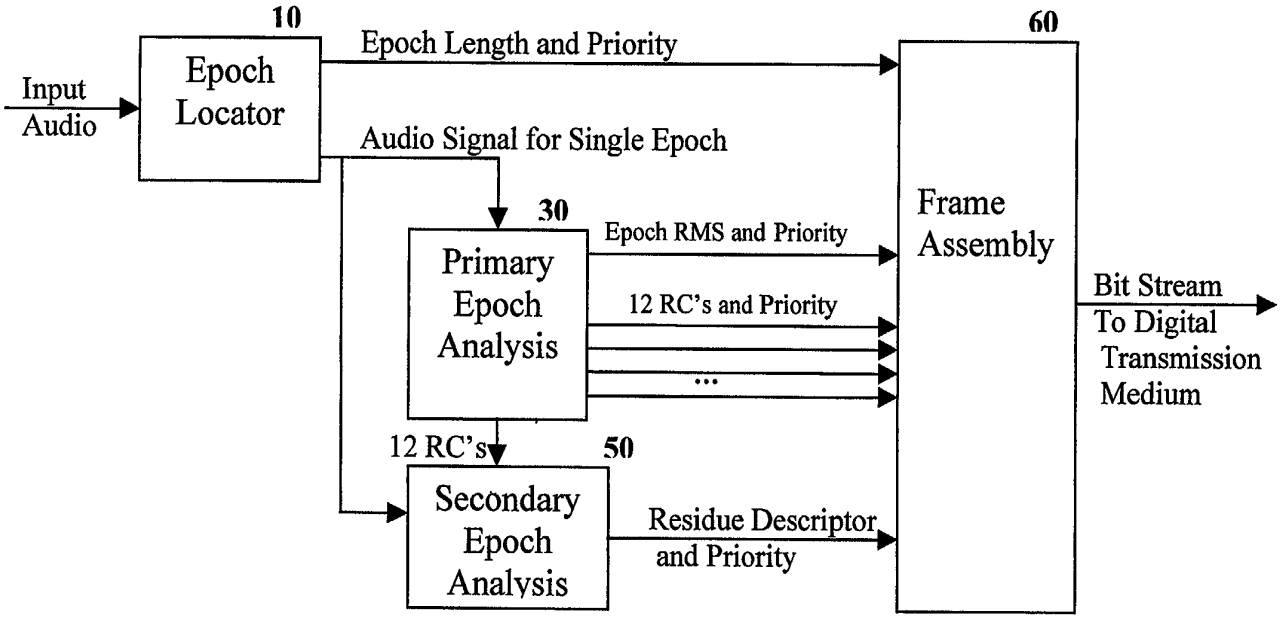
10
Epoch Locator
Input Audio
Epoch Length and Priority
Audio Signal for Single Epoch
30
Primary Epoch Analysis
Epoch RMS and Priority
12 RC's and Priority
...
12 RC's
50
Secondary Epoch Analysis
Residue Descriptor and Priority
60
Frame Assembly
Bit Stream To Digital Transmission Medium

Figure 1.

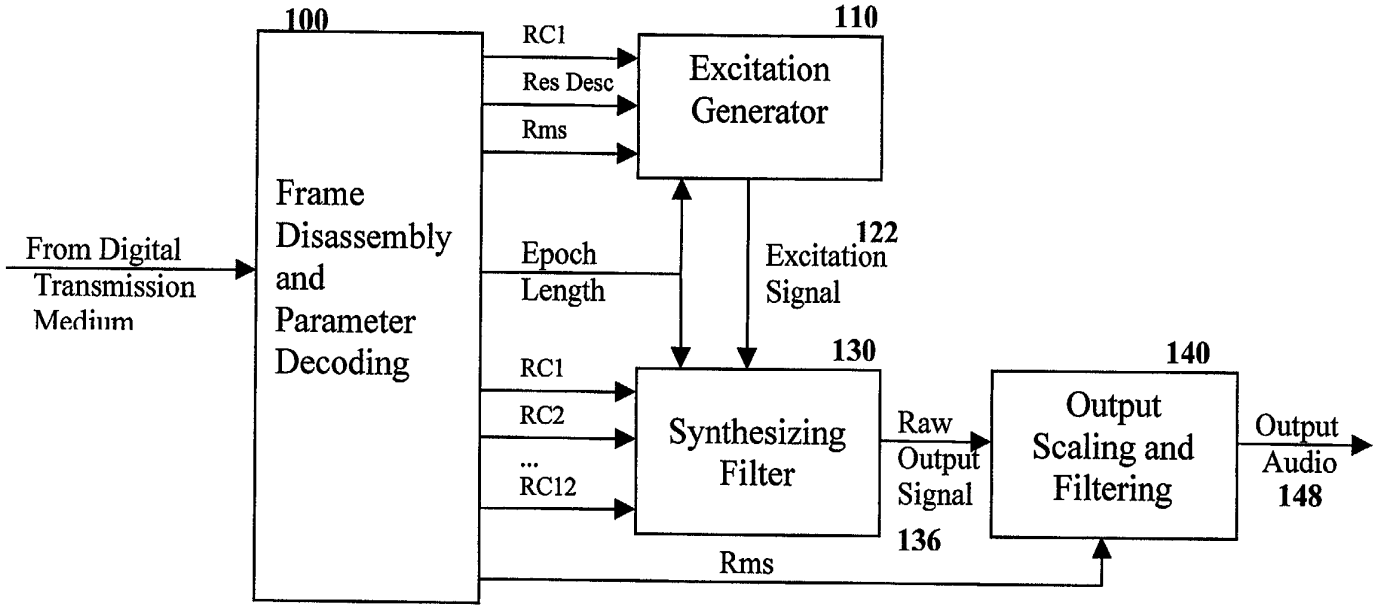
100
Frame Disassembly and Parameter Decoding
From Digital Transmission Medium
RC1
Res Desc
Rms
Epoch Length
RC1
RC2
...
RC12
110
Excitation Generator
122
Excitation Signal
130
Synthesizing Filter
Raw Output Signal
136
Rms
140
Output Scaling and Filtering
Output Audio
148

Figure 2.

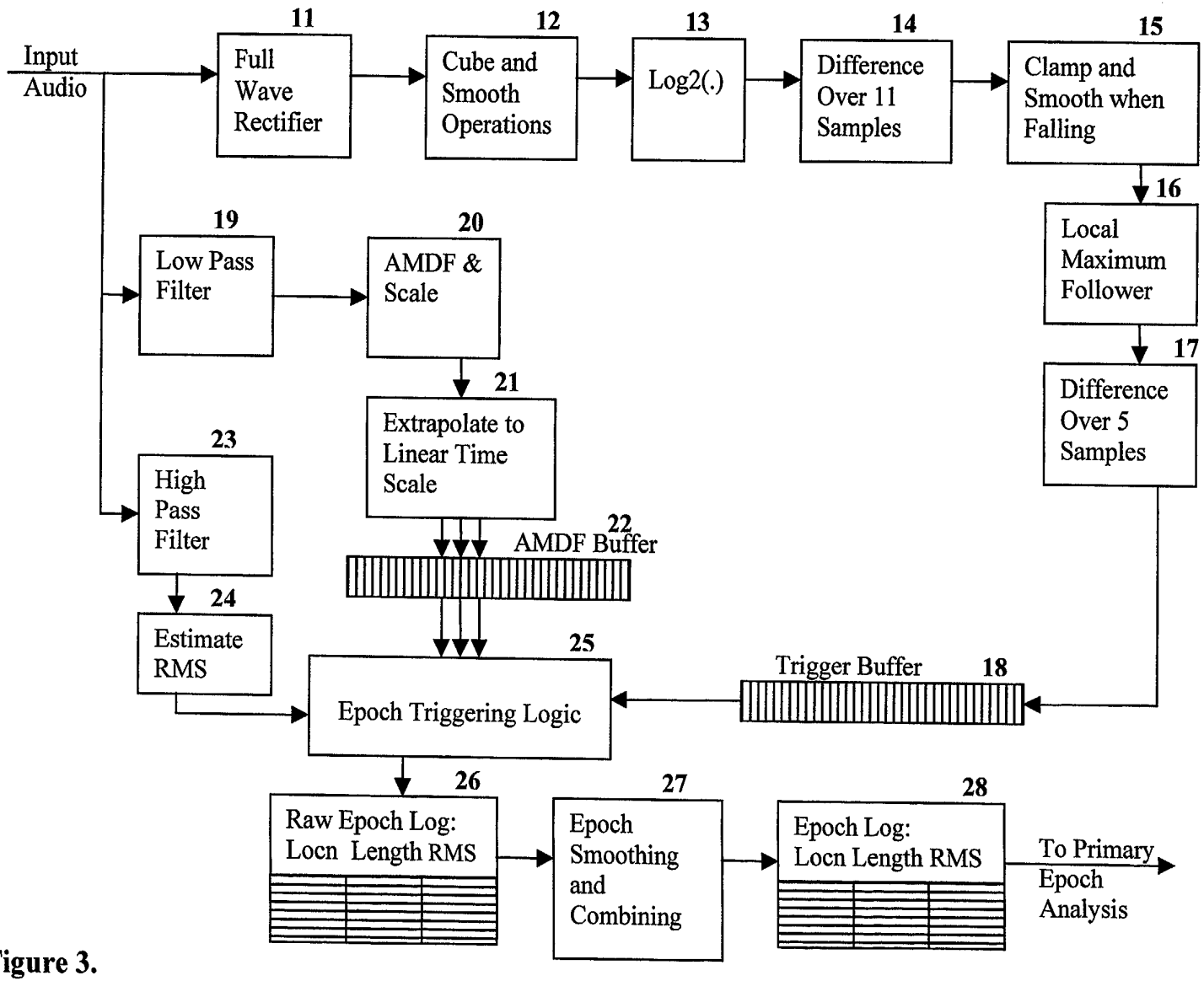
Input Audio
11
Full Wave Rectifier
12
Cube and Smooth Operations
13
Log2(.)
14
Difference Over 11 Samples
15
Clamp and Smooth when Falling
16
Local Maximum Follower
17
Difference Over 5 Samples
19
Low Pass Filter
20
AMDF & Scale
21
Extrapolate to Linear Time Scale
22
AMDF Buffer
23
High Pass Filter
24
Estimate RMS
25
Epoch Triggering Logic
Trigger Buffer
18
26
Raw Epoch Log: Locn Length RMS
27
Epoch Smoothing and Combining
28
Epoch Log: Locn Length RMS
To Primary Epoch Analysis

Figure 3.

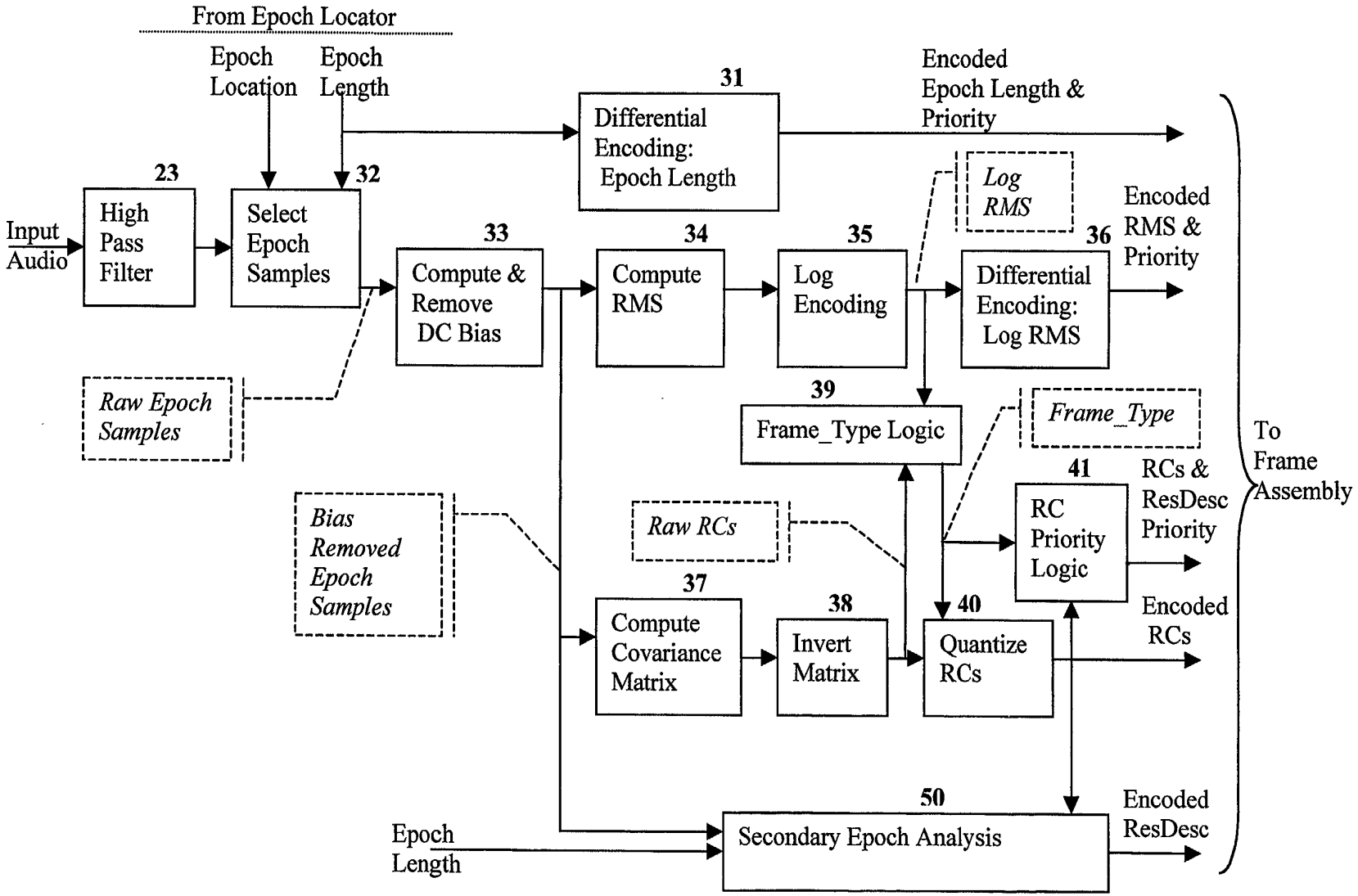
From Epoch Locator
Epoch Location
Epoch Length
23
High Pass Filter
Input Audio
32
Select Epoch Samples
Raw Epoch Samples
31
Differential Encoding: Epoch Length
Encoded Epoch Length & Priority
33
Compute & Remove DC Bias
34
Compute RMS
35
Log Encoding
Log RMS
36
Differential Encoding: Log RMS
Encoded RMS & Priority
39
Frame_Type Logic
Frame_Type
41
RC Priority Logic
RCs & ResDesc Priority
Bias Removed Epoch Samples
Raw RCs
37
Compute Covariance Matrix
38
Invert Matrix
40
Quantize RCs
Encoded RCs
50
Secondary Epoch Analysis
Epoch Length
Encoded ResDesc
To Frame Assembly

Figure 4.

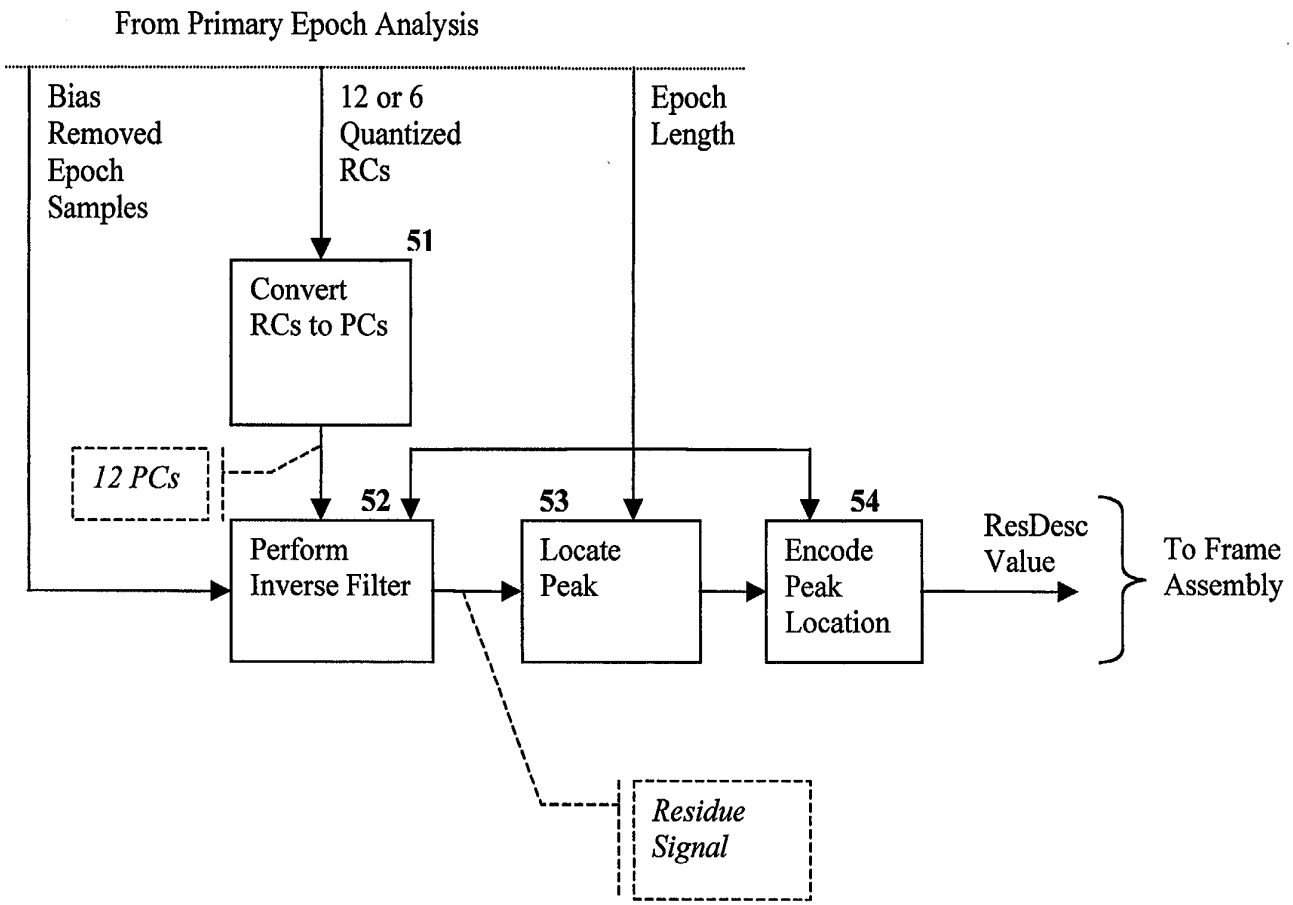
From Primary Epoch Analysis
Bias Removed Epoch Samples
12 or 6 Quantized RCs
Epoch Length
51
Convert RCs to PCs
12 PCs
52
53
54
Perform Inverse Filter
Locate Peak
Encode Peak Location
ResDesc Value
To Frame Assembly
Residue Signal

Figure 5.

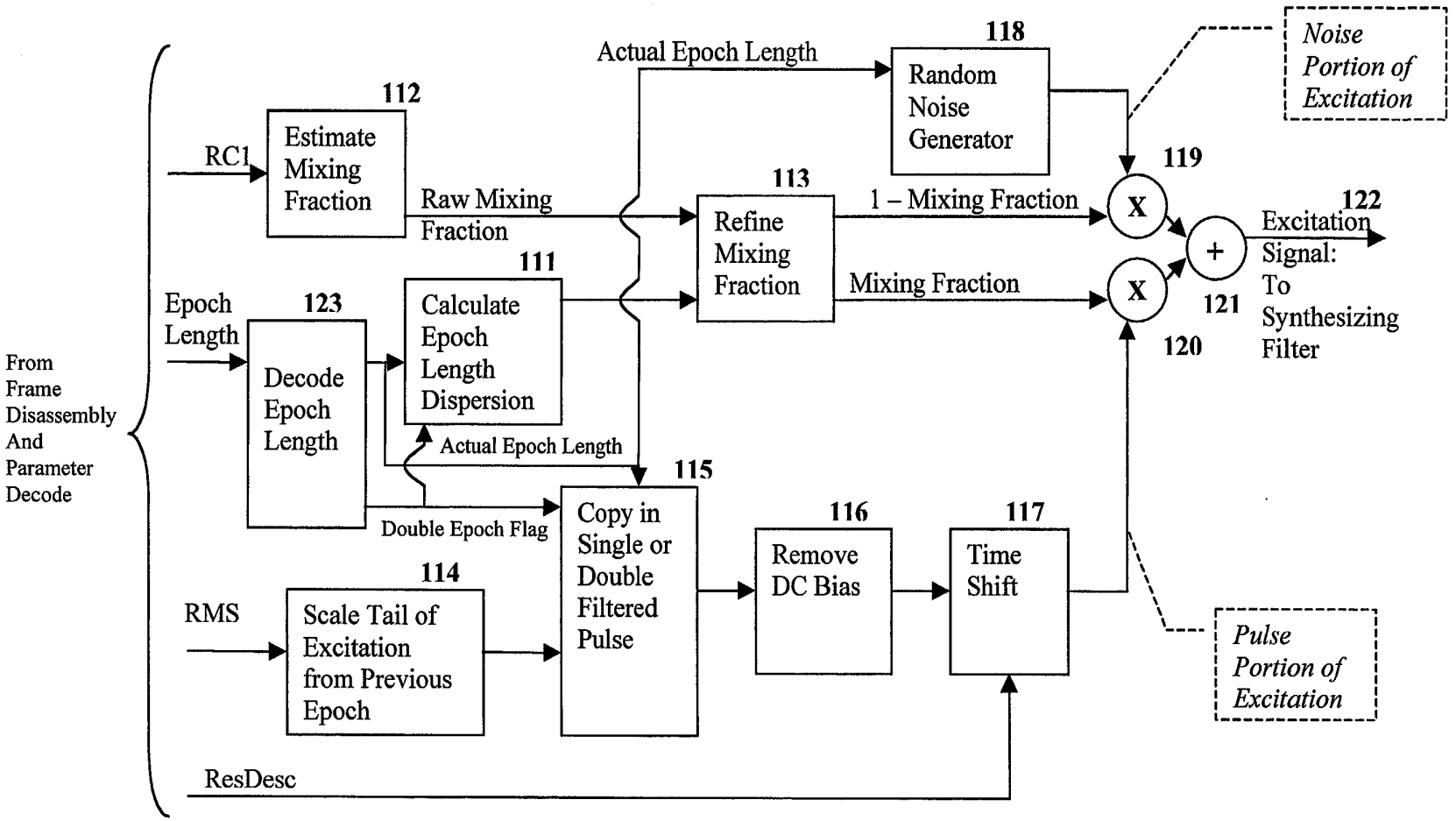
From Frame Disassembly And Parameter Decode
RC1
112
Estimate Mixing Fraction
Raw Mixing Fraction
Actual Epoch Length
118
Random Noise Generator
Noise Portion of Excitation
119
113
Refine Mixing Fraction
1 – Mixing Fraction
Mixing Fraction
X
X
+
121
120
122
Excitation Signal: To Synthesizing Filter
Epoch Length
123
Decode Epoch Length
111
Calculate Epoch Length Dispersion
Actual Epoch Length
Double Epoch Flag
115
Copy in Single or Double Filtered Pulse
116
Remove DC Bias
117
Time Shift
Pulse Portion of Excitation
RMS
114
Scale Tail of Excitation from Previous Epoch
ResDesc

Figure 6.

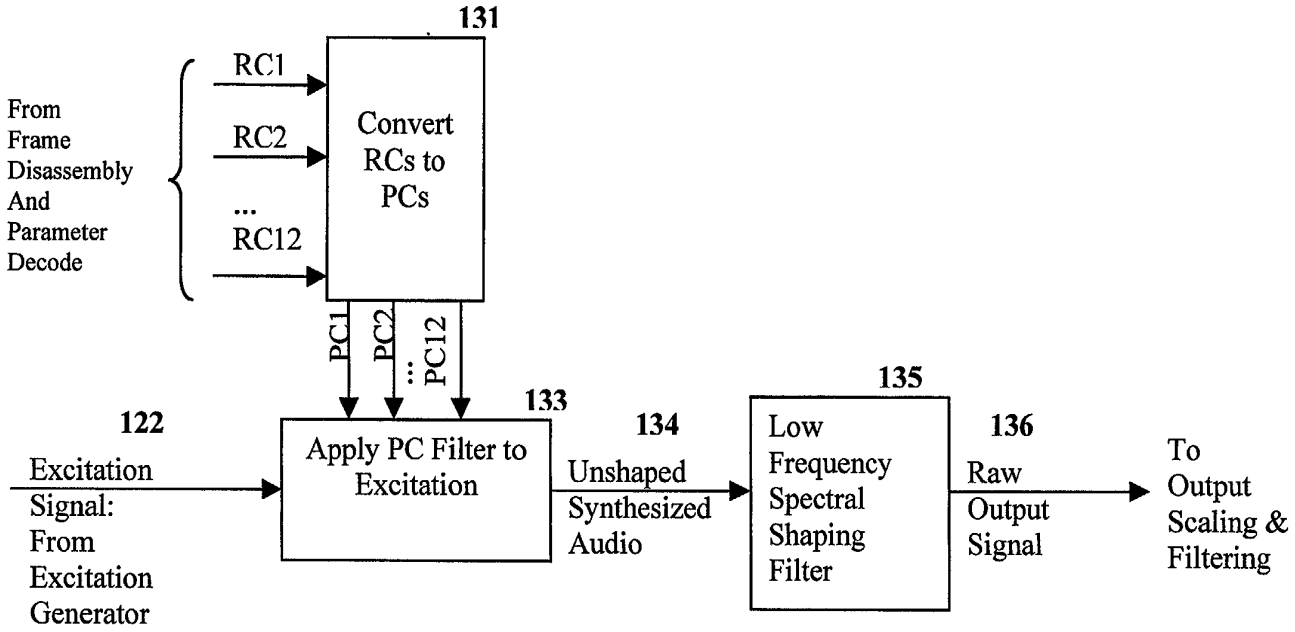
131
RC1
RC2
...
RC12
From
Frame
Disassembly
And
Parameter
Decode
Convert
RCs to
PCs
PC1
PC2
...
PC12
122
Excitation
Signal:
From
Excitation
Generator
133
Apply PC Filter to
Excitation
134
Unshaped
Synthesized
Audio
135
Low
Frequency
Spectral
Shaping
Filter
136
Raw
Output
Signal
To
Output
Scaling &
Filtering

Figure 7.

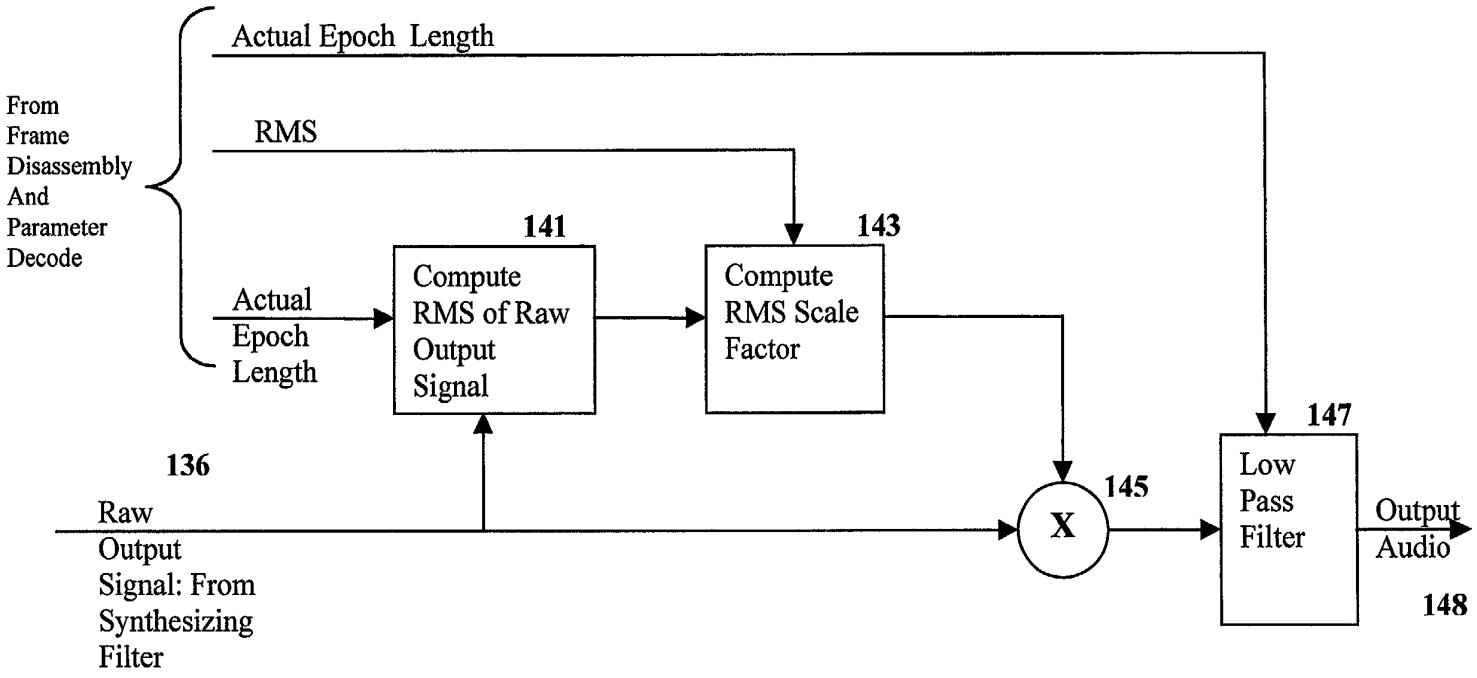
Actual Epoch Length
From Frame Disassembly And Parameter Decode
RMS
141
143
Actual Epoch Length
Compute RMS of Raw Output Signal
Compute RMS Scale Factor
147
136
145
Low Pass Filter
Output Audio
Raw Output Signal: From Synthesizing Filter
X
148

Figure 8.